Nutricola tantilla (*Transennella tantilla*)

(Gould, 1852)

Phylum: Mollusca
Class: Bivalvia; Heterodonta
Order: Veneroida
Family: Veneridae (Meretricinae)

Description

Size—to 6 mm long (1/4 "); this specimen 3.5 mm long, 3.0 mm high, 1.6 mm diameter (figs. 1, 2).
Color—cream, with one third of shell a purple brown at posterior end, radiating from beak (fig. 1). Interior creamy white with same purple or brown coloration; occasionally a radial strip anteriorly (Oldroyd 1924) (figs. 3, 4).
Shell Shape—a rounded isosceles triangle (Kozloff 1974b): elongate or oval; heavy, solid, slightly longer than high, but definitely triangular. Anterior and posterior dorsal margins straight. Beaks almost central. barely anterior to midline, often eroded (Kozloff 1974a). Surface with fine concentric grooves only, no other sculpture (ibid). Valves equal, not gaping. No rough periostracum, but byssal attachments may cover part of surface.
Interior—ventral margin smooth, not crenulated. (Margin with a few oblique grooves on inner ventral margin, but these are visible only with very high magnification).
Ligament—external: no resilifer or internal ligament (fig. 2).
Hinge Area—three divergent cardinal teeth in each valve (figs. 3, 4); lateral teeth conspicuous; anterior teeth in both valves: genus Transennella. Socket for lateral tooth in right valve (fig. 3).
Pallial Sinus—rounded, bent anteriorly, parallel to ventral margin, not bent sharply upward: genus Transennella, (fig. 3).
Byssus—byssal threads for attachment to substrate (sand grains); rare in Veneridae; fine, clear (fig. la); byssal threads also join young in brood pouch. Byssal gland in middle of foot.
Siphons—short, sensitive, extend only a few mm from body. Excurrent and incurrent siphons fused proximally; tentacles long, flexible: 9-12 in excurrent, 10-14 in incurrenti (Maurer 1967b): species tantilla (fig. 1b).
Foot—large, can bury quickly.
Young—development takes place in parent's mantle cavity; up to 300 young per adult. Size of adult determines number of young. Young without velum, or pelagic stage (Hansen 1953).

Possible Misidentifications

Transennella is much smaller than most adult bivalves, but juveniles of other clams might be confused with it. Some other Veneridae have concentric sculpture, like *Transennella*, but have predominately radial sculpture:

Mercenaria mercenaria (= Venus), the round, inflated introduced Atlantic quahog;

Protothaca tenerrima, flattened, with sharply ridged concentric rings, and inconspicuous beaks;

Protothaca staminea (= Venerupsis), (= Paphia), the rock cockle, with fine radiating ribs and weak concentric ridges, a crenulated inner margin and entirely fused siphons; (neither of the *Protothacae* has anterior lateral teeth),

Tapes japonica, the introduced Japanese cockle, with strong radial ribs and a prominent ligament,
elongate oval shell and, like *Transennella*, a purple stain in the interior,

Saxidomus nuttalli and *Saxidomus giganteus*, the Washington clams, are ovate, with heavy concentric rings and a pronounced gape to the valves; both have anterior lateral teeth. *S. nuttalli* has an interior marked with purple, but is rare as far north as Oregon.

Two small venerid clams are quite close to *Transennella*:

Gemma gemma, the small (about 2.5 mm) purple-marked Atlantic bivalve, can be common in bay mud. It is triangular, and no longer than high; its left hinge lacks the characteristic anterior lateral tooth of *Transennella*; its ventral margin is finely crenulate, not smooth; its pallial sinus is bent sharply upward, not rounded and angled anteriorly. Like *Transennella*, it has 3 cardinal teeth in each valve. *Gemma* often has *Enteromorpha* attached to its posterior; it can be found in the same habitat as *Transennella* (Puget Sound) but in California (Tomales Bay) it occupies a different niche (Norchi 1971).

Psephidia, the pebble shell, is a subtidal inflated venerid clam of the same size and same general appearance as *Transennella*. It has three cardinal hinge teeth, but no anterior lateral teeth in either valve, as *Transennella* does. Its beak is more prominent than *Transennella*'s, and its internal ventral margin, under magnification, is finely crenulated. It can be white or olive, but has no purple posterior third. There are two species, *P. ovalis* and *P. lordi*.

Mysella (= *Rochefortia*) is a small white clam with the beaks near the anterior end, and no cardinal teeth. It is found in Puget Sound, but has not been reported from Oregon.

Current confusion exists about the two species of *Transennella* (Coan and Carlton 1975). *T. tantilla* has purple markings, an eroded beak, clearly marked concentric lines on its shell. Its hinge plate is wide, its anterior tooth well-developed. It has split siphons (for 1/s their length), with flexible tentacles (9-12 on the excurrent, 10-14 on the incurrent siphon).

*Transennella*_____, the other species, is all white, without purple on the posterior, with only an occasional brown slot anterior to its beaks (Marelli); the beaks are prominent, not eroded; the shell sculpture is faint, of numerous fine lines. The hinge plate is narrow, the anterior tooth thin and lamellar. This species has siphons fused for almost their whole length, short stiff siphon tentacles, with 10-14 tentacles on the excurrent siphon, 11-16 on the incurrent one (Maurer 1967b). The two species some-times occur together.

Ecological Information

Range—Sitka, Alaska, to Lower California (Oldroyd 1924).

Local Distribution—Coos Bay: South Slough channel edge (Coastal Acres).

Habitat—sand or sandy mud in protected bays this specimen in clean sand at channel edge (Smith and Carlton 1975); often in other shells, where it attaches by its byssal threads. (Presence of byssus may limit its ability to spread geographically"). Also found in eelgrass roots (*Zostera, Phyllospadix*) (Obreski 1968), and in firm mud, or sandy gravel (Smith 1960). Nearly always in top cm of substrate (Smith 1960). Can tolerate turbidity, remain shut for long periods to avoid deleterious effects of some substrates, *ie*. clay, or simply ingest clay and process through its system (Maurer 1967b)

Salinity—full seawater, collected at 30 ‰ salt.

Temperature—cold to temperate waters, as indicated by geographical range.

Tidal Level—low intertidal as well as offshore down to 35 m (Keen and Coan 1974).

Associates—*Macoma inquinata*. Heavily infested by trematode *Telolecithus pugetensis*, for which it is the first intermediary and sometimes the second intermediary host. *T. tantilla* ingests trematode eggs, which as sporocysts destroy much of its visceral mass and gonads; infected adult then becomes sterile Tomales Bay (DeMartini and Pratt 1964): infested by trematode *Parvaterma* (Obreski 1968).

Quantitative Information

Weight—mean dry weight of largest-sized individuals: 30.2 mg (Pamatmat 1966). Weight can be determined by length of clam. log weight (mgs) = -0.85598+3.09033 log length (mm) (ibid).

Abundance—densest at mean lower low water in troughs between sandbars. where they are one of the numerically dominant animals (Puget Sound) (ibid). Density 1500-2500/mm^2 (South Slough, Coos Bay) (Asson, pers com.).

Life History Information

Reproduction—protandrous hermaphrodite. viviparous. Broods young within shelf. eggs and young of all stages can be found in adult brood chamber between inner gill and body walla nearly all large clams (which are mostly female) will have young at all times of year. No clear spawning period, but young leave mother only in summer. Among smallest clams, males and females are found in equal numbers (Hansen 1953). Fecundity affected by sterilizing effect of trematode sporocysts (DeMartini and Pratt 1964).

Growth Rate—to 4 mm in four months From 2.6 mg (van.) to 30 mg (Sept.): total weight gain/animal 0.953 mg/mo (Hansen 1953, Pamatmat 1966). Ripe egg diameter 0.25 mm; oldest stage of young, 0.65 mm (Hansen 1953); smallest adults with eggs, 3.2 mm (Pamatmat 1966).

Longevity—probably a little over one year (Hansen 1953).

Food—a suspension feeder on small particles, without special adaptations (Norchi 1971); not a deposit feeder. Diatoms *Navicula bidulphia*, *Coscinodiscus*, as well as *Nitzschia* and *Melosira* (Maurer 1967b). Probably feeds at night (Obreski 1968).
Predators—fish. *Cymatogaster* (surf perch) is the host to the adult trematodes (DeMartini and Pratt 1964), also shorebirds, some gastropods (Obreski 1968).
Behavior—can bury itself in less than a minute if disturbed (Norchi 1971): but is on or near surface when feeding.

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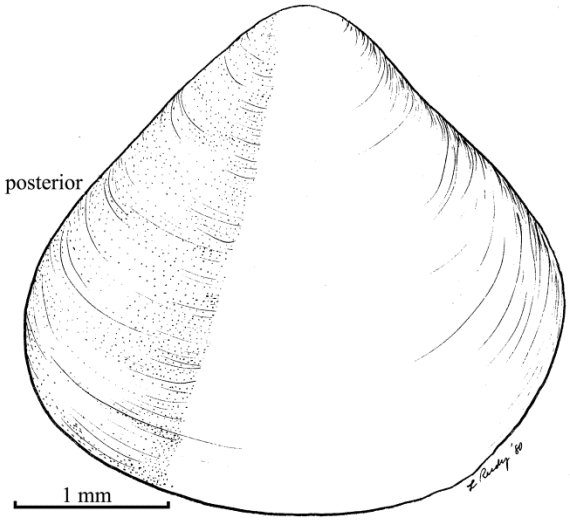
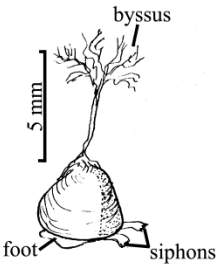
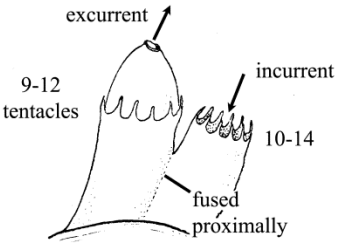
Nutricola tantilla



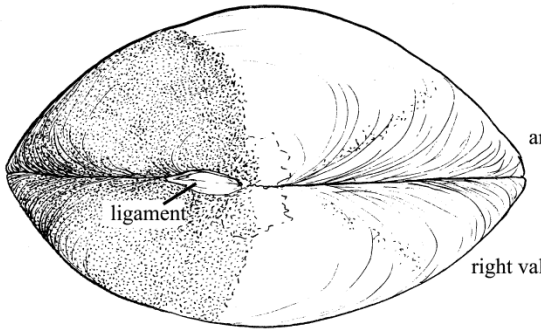
1. *Nutricola tantilla*, right valve (L:3.5mm, D:1.6mm, H:3.0mm) x28: shell solid, triangular; posterior third purple; fine concentric sculpture; no periostracum



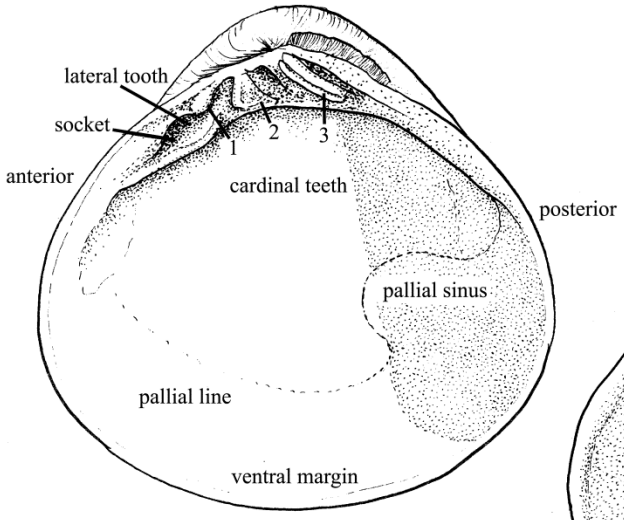
1a. Live clam x4



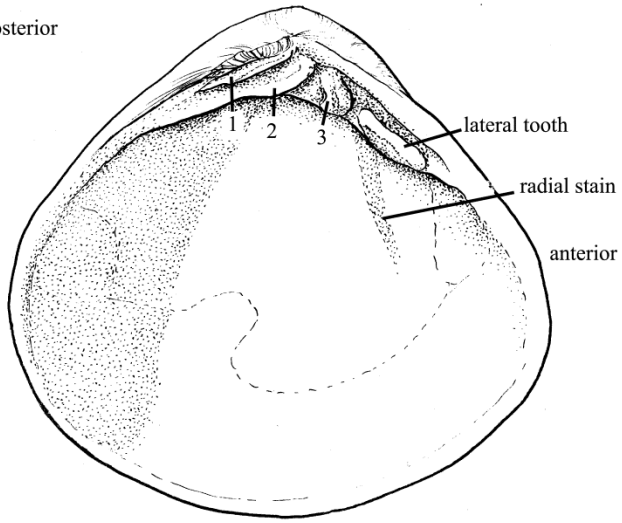
1b. Siphons



2. Exterior (dorsal view): valves equal; beaks almost central; ligament external; no gape to valves.



3. Interior, right valve: three divergent cardinal teeth, one anterior lateral tooth, socket; pallial sinus rounded; purple stain posteriorly; smooth ventral margin.



4. Interior, left valve: three cardinal teeth, one anterior lateral tooth; anterior radial purple stain..